

**PATENT COOPERATION TREATY**  
**PCT**  
**INTERNATIONAL PRELIMINARY EXAMINATION REPORT**  
(PCT Article 36 and Rule 70)

REC'D 17 JAN 2005

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PCT

Applicant's or agent's file reference A1-231-PCT	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US 03/39595	International filing date (day/month/year) 11.12.2003	Priority date (day/month/year) 20.12.2002
International Patent Classification (IPC) or both national classification and IPC H01R12/20		
Applicant MOLEX INCORPORATED et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
  
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
  - This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 3 sheets.
  
3. This report contains indications relating to the following items:
  - I  Basis of the opinion
  - II  Priority
  - III  Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - IV  Lack of unity of invention
  - V  Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - VI  Certain documents cited
  - VII  Certain defects in the international application
  - VIII  Certain observations on the international application

Date of submission of the demand  09.07.2004	Date of completion of this report  14.01.2005
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer  Garcia Congosto, M Telephone No. +49 89 2399-7446



**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No.

PCT/US 03/39595

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

1-11 as originally filed

**Claims, Numbers**

1-16 received on 23.12.2004 with letter of 23.12.2004

**Drawings, Sheets**

1/9-9/9 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- the language of publication of the international application (under Rule 48.3(b)).
- the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- contained in the international application in written form.
- filed together with the international application in computer readable form.
- furnished subsequently to this Authority in written form.
- furnished subsequently to this Authority in computer readable form.
- The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- the description, pages:
- the claims, Nos.:
- the drawings, sheets:

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5.  This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).  
*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes: Claims	1-16
	No: Claims	
Inventive step (IS)	Yes: Claims	1-16
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-16
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

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**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

1. Reference is made to the following document:

D1: GB-A-1 432 604 (BUNKER RAMO) 22 April 1976 (1976-04-22)  
D2: US-B-6 447 3401 (WU JERRY) 10 September 2002 (2002-09-10)  
D3: US-B-6 338 6341 (YU HUNG-CHI) 15 January 2002 (2002-01-15)

2. Claim 2 appears to meet the requirements of the PCT with respect to novelty and inventive step for the following reasons:

Document D1, which is considered to represent the closest prior art discloses:

"A connector comprising: a housing (10) including a first housing wall (14) and a second housing base wall (15) connected to said first housing wall (through 12 and 16) and spaced therefrom, a plurality of ribs (23) extending from said housing wall and spaced apart from each other such that a slot (space between walls 27 and "ribs" 23) is defined between adjacent ribs; each said rib (23) includes a first rib portion (57) and a second rib portion (portion at the left of 57 on the same rib); and at least one terminal (37) positioned within each said slot and connected to said housing (page 2, lines 93-96) such that a surface area of said terminal is exposed to the environment (upper surface in figure 1) and air can flow over said surface area (air can flow in through the apertures 53, 54, 48 and slots 60 and 61) to dissipate heat from said at least one terminal."

The subject-matter of claim 1 differs from the prior art in that:

F1: "each said rib portions extends from each said housing base wall, each said first rib portion extends from said respective housing wall in a first direction such that each said slot has a first slot portion, and each said second rib portion extends from said respective housing base wall, in a second, opposite direction,

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such that said slot has a second slot portion."

Note that the first and second "rib portions" (57) of D1 do not extend from the housing but from the rib (23) itself.

The problem to be solved by the present invention may be regarded as how to increase air flow around the terminals.

The solution is provided by the subject matter of claim 1, see especially feature F1. Two portions of the slot receiving the terminal extend from the housing wall. In these portions the terminal is not covered by the housing wall and is exposed to the environment.

The invention is neither disclosed in nor rendered obvious by either one of the prior art documents listed in the European Search Report. F1 is not disclosed in any of these documents. All the "portions" of the "ribs" disclosed in D2 extend in the same direction and not in opposite directions as in F1. The connector of D3 does not disclose any portions that can be interpreted as a "rib" within the wording of claim 1. Nothing in these documents indicates the present invention, therefore claim 1 seems to be new and inventive.

- 2.2 Claims 2-16 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

**CLAIMS:**

1. A connector comprising:

a housing including a housing wall, a plurality of ribs extending from said housing wall and spaced apart from each other such that a slot is defined between adjacent ribs; and

5 at least one terminal positioned within each said slot and connected to said housing such that a surface area of each said terminal is exposed to the environment and air can flow over said surface area to dissipate heat from said at least one terminal.

2. A connector as defined in claim 1, wherein said housing wall is a first housing base wall and said housing further includes a second housing base wall connected to said first housing wall and spaced therefrom, each said rib includes a first rib portion and a second rib portion extending from each said housing base wall, each said first rib portion extending from said respective housing base wall in a first direction such that each said slot has a first slot portion, and each said second rib portion extending from said respective housing base wall in a second, opposite direction, such that each said slot has a second slot portion.

5 3. A connector as defined in claim 2, wherein at least one of said terminals is positioned within a respective first slot portion and second slot portion.

4. A connector as defined in claim 2, wherein each said terminal includes a terminal base wall, a first terminal portion extending from said terminal base wall and a second terminal portion extending from said terminal base wall in the same direction, said first and second terminal portions being positioned within a respective first slot portion, respective ones of said terminal base walls being positioned within a respective second slot portion.

5. A connector as defined in claim 4, wherein said housing further includes a housing central wall provided between said first and second housing base walls such that a first aperture is provided between said housing central wall and said first housing base wall and a second aperture is provided between said housing central wall and second housing base wall, said first terminal portion being positioned within a respective first aperture and said second terminal portion being positioned within a respective second aperture.

6. A connector as defined in claim 5, wherein each said terminal further includes means for connecting said terminal to an associated printed circuit board, said second terminal means extending beyond ends of said second rib portions.

7. A connector as defined in claim 5, wherein each said terminal further includes means for connecting said terminal to said housing.

8. A connector as defined in claim 5, wherein each said terminal further includes an enlarged head on said first terminal portion and an enlarged head on said second terminal portion.

9. A connector as defined in claim 5, wherein said first aperture is wider than a width of said first terminal portion such that air can flow through said aperture, and wherein said second aperture is wider than a width of said second terminal portion such that air can flow through said aperture.

10. A connector as defined in claim 9, wherein two terminals are provided between adjacent ribs and said first aperture is wider than a width of said two terminals such that air can flow through said aperture, and wherein said second aperture is wider than a width of said two terminals such that air can flow through said aperture.

11. A connector as defined in claim 1, wherein said wall is a housing central wall and said housing further includes a first housing base wall and a second housing base wall connected to said housing central wall, said first housing base wall, said housing central wall and said second housing base wall being spaced apart from each other such that a first aperture is provided between said housing central wall and said first housing base wall and a second aperture is provided between said housing central wall and second housing base wall, said at least one terminal being positioned within said apertures such that an additional surface area of each said terminal is exposed to the environment and air can flow over said surface area to dissipate heat from said at least one terminal.

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12. A connector as defined in claim 11, wherein two terminals are provided between adjacent ribs.

13. A connector as defined in claim 11, wherein each said terminal includes a terminal base wall, a first terminal portion extending from said terminal base wall and a second terminal portion extending from said terminal base wall in the same direction, said first terminal portion being positioned within said first aperture and a respective slot, said second terminal portion being positioned within said second aperture and a respective slot, said terminal base walls being positioned within a respective slot.

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14. A connector as defined in claim 13, wherein said first aperture is wider than a width of said first terminal portion such that air can flow through said aperture, and wherein said second aperture is wider than a width of said second terminal portion such that air can flow through said aperture.

15. A connector as defined in claim 13, wherein two terminals are provided between adjacent ribs.

16. A connector as defined in claim 1, wherein two terminals are provided between adjacent ribs.

17. A connector as defined in claim 16, wherein said two terminals provided between adjacent ribs have the same polarity.